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Document Name : User Manual for SC10EJ Serial to Ethernet Converter

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SC10 EJ is Serial to Ethernet PCB Module. It is an Interface Converter between Ethernet and RS232 / RS485 2 / 4 Wire devices. The Serial & Ethernet Ports along with the LED indications are on the front facia, the Power Supply jack is on the Right-Back side & the DIP switches on the Right-Front side.

1. TECHNICAL SPECIFICATIONS

Communication Interfaces	
Ethernet Interface	10 / 100 Base Mbps
Serial Interface	RS-232 or RS485 2/4 Wire.
Baud Rates	1200 to 115 Kbps.
Network Protocols	TCP, IP, ICMP, ARP, Telnet, UDP, HTTP.
Configuration	Serial port, Ethernet Port, Utility on a PC, HTTP.
Indications	4 Status LED's for Serial & Ethernet activities.
Modes	Both Master / Slave Modes are possible.
Mechanical : Connectors	
RS232 / RS485 / 422	9 Pin Howder Connector.
Ethernet	RJ45.
Dimensions	EJ : 126 mm x 80 mm x 40 mm (L x W x H).
Power Supply	
Power Supply	230V AC. Range 90 to 270V AC.
Environmental	
Operating Temperature	0°C to 55°C.
Relative Humidity	10 to 90 % RH non-condensing.

Table - 1

2. MODES OF OPERATION

The SC10 EJ Converter operates in the following modes: -

Configuration Mode :

Through Serial Mode : By any Terminal Software or our PC Side Utility.
Through Ethernet Mode : Our PC Side Utility.
Through Telnet

This mode is used to configure the SC10 EJ's functional parameters / settings via the Serial port. If at "Power On", DIP 1 & 3 are ON, you can enter the Configuration mode.

NOTE : DIP1 is to be turned ON only if the configuration is being done through RS232 port.
Turn DIP 1 OFF after configuration through Serial Port & Reset the Converter.

Normal Mode :

If at Power ON, DIP 1 is OFF then SC10 EJ will go in Normal operating mode. In TCP Slave mode, it will directly go in Disconnect State, waiting for connection, while in case of TCP Master Mode, it will try to establish connection with remote device.
In the Normal mode, SC10 EJ performs the data conversion from Ethernet to Serial and vice a versa.

3. Configuration Procedure : Through Serial Port :

Configuration Procedure : Through Serial Port :

1. Make DIP 1 & 3 ON.
2. Connect Tx, Rx and Gnd of SC10 EJ to the COM Port of the PC as per fig. 5.
3. Start **HyperTerminal** on PC.
4. Select the same COM Port of the PC to which SC10 EJ is connected.
5. Setup **Hyper Terminal** with following settings:
    a. Baud Rate : 9600 bps
    b. Data Bits : 8
    c. Parity : None
    d. Stop bits : 1
    e. Flow Control : None

Power On SC10 EJ .

A **Configuration Menu** with all the default parameters will be displayed as shown below :

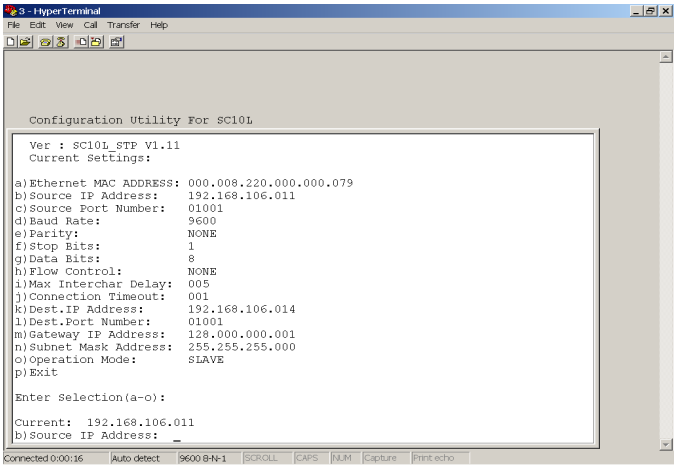

Figure 1

If user wishes to change any of the default parameters, simply type corresponding letter (viz. b or B for setting IP Address etc.), then list of current set value and options available for that particular parameter will be displayed. Enter the option required and upon pressing Enter key, same value will be again displayed in configuration menu as default parameter.

Various Configuration setting options available in SC10 EJ are : -

IP Address
It should be in "**Dot-Decimal**" format, i.e. "192.168.106.11". : **Default: 127.0.0.1**

Port Number : It must be in 0 to 65534 range. (Except Port number 65535). **Default : 1001**
Baud Rate : Select from : 1200, 2400, 4800, 9600, 19200, 38400 and 57600bps. **Default : 9600bps**
Parity : Select Parity from : None, Even, Odd. **Default: None**
Stop Bits : Select Stop bits from : 1 bit, 2 bits. **Default: 1 bit**
Data Bits : Select Bits per byte from : 7 bits/byte, 8 bits/byte. **Default: 8 bits / byte**
Flow Control : Select Flow control as : None, RTS / CTS. **Default: None**

Maximum Intercharacter Delay
SC10 EJ packets the Serial data & sends it to Ethernet. If the characters in the packet are less than 255 bytes, the above parameter will come into play. After last character has been received from serial side, the converter waits for this time before sending the packet. Value of 0 disables this function. Actual delay is calculated as Maximum Intercharacter Delay X 10ms, i.e. it can be in the 10 - 2550ms range.
Default: 10 (i.e. 10 msec)

Connection Timeout
Specifies timeout (in minutes) for the TCP/ IP connections in case there is no transaction of data in any direction. Timeout should be in the range 0 to 255. Value of 0 disables this function (connection never times out).
Default: 5 (5 minutes)

Destination IP
Defines the Destination IP Address. It should be in "dot-decimal" format, i.e. "198.168.106.14".
Default: 0.0.0.0

Destination Port Number
Defines the destination data port number. Between 0 to 65535 range. (Except Port number 65535) **Default: 1001**

Gateway IP address
Defines the IP address of the Network's Gateway to which the SC10 EJ is connected. It should be in "dot-decimal" format, i.e. "128.0.0.1". **Default: 0.0.0.0**

SubNet Mask Address
It defines whether the Destination IP address is considered to be on the local network segment or foreign network segment. It should be in "dot-decimal" format, i.e. "255.255.255.0". **Default: 0.0.0.0**

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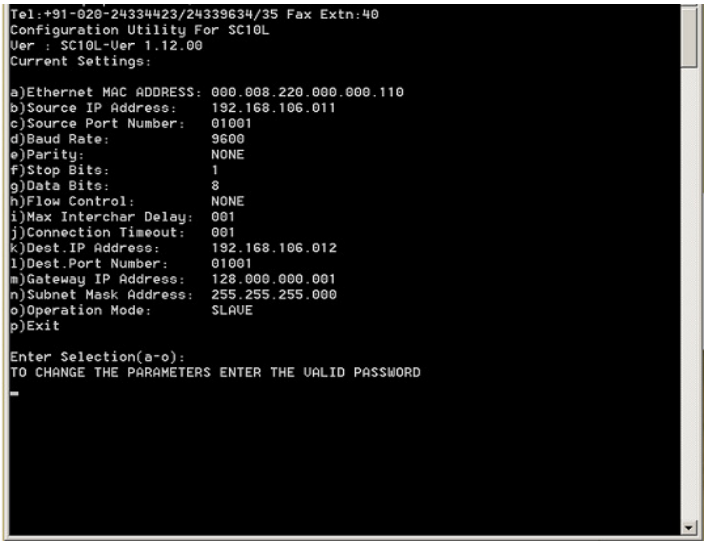
Operation Mode

Selects "Slave or Master Routing Mode". **Default: Slave.**

Configuration Procedure : Through Telnet:



1) Go to Start → Run.
2) Type Command
3) MSDOS Command Prompt will be displayed.
4) Type C:\telnet 192.168.106.11 (Type previously set Source IP address for present configuration) and press Enter.
5) Configuration menu will be displayed as shown in the screenshot in below diagram.

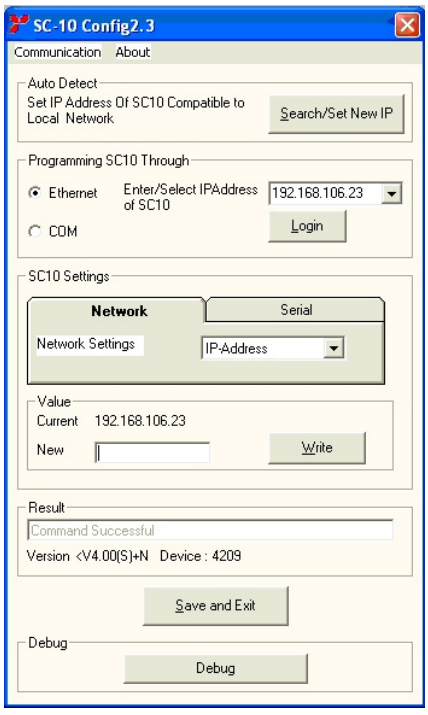
After the Configuration menu is displayed, configuration should be done in the same way as is done for Serial Port configuration through Hyper Terminal.

Following features are provided while using Telnet menu :

Figure – 2

1) If communication is established and data transfer is in progress and Telnet menu is invoked, then the user will be asked to enter valid PASSWORD. Once user enters valid password, Data transfer will stop and Configuration menu will be displayed. Default password is " net " and is case sensitive.
2) If Telnet menu is invoked and valid Password is not entered for one minute, then connection to host ID i.e. Device is lost.
3) If valid password is entered and menu is displayed but afterwards no action is performed to change any of the parameters then connection to device is lost.
4) After changing the parameters, when we press 'p or 'P' to end the configuration.

Configuration Procedure through Ethernet Mode (PC side utility provided):



When configuring the SC10 EJ through PC side utility use the following steps:

1) Start SC10 EJ Config utility (Through shortcut on desktop or through Start -> Programs -> SC10Config -> SC10Config)
2) Go to step 3 if IP address of SC10 EJ converter is not according to the required local network settings.
3) Search for the SC10 EJ Converter by pressing "Search " Button on the utility.
4) If only one SC10 EJ converter is present on the network, then an IP address setting dialog box will appear in this box. Set the IP address as pre your network configuration.
5) If more than one SC10 EJ converter are attached to the network, then a list box containing MAC address of the converters will appear. From this list, select any MAC address and set the IP address for the corresponding converter.
6) After IP address has been set, select "Ethernet" under "Programming SC10 through" Option. Enter the "Set IP Address" in Drop Down list given in front of "Enter/Select IP Address of SC10." Now press "Login" again.

Figure 3

Note:

a) Make sure that the IP of the converter and PC are within the same range. I.e. if the IP address of the converter is 192.168.106.xxx then the IP address of the PC must be 192.168.106.yyy.

b) To make sure the converter is reachable, you can Ping the converter.

c) The IP address of the PC can be configured from Control Panel → Network -> Protocol -> TCP/IP (Properties).

d) If the connection is established, the appropriate version and a message will be displayed at the bottom of the window. When the desired settings are done, converter should be returned to "Normal Mode" by pressing "Save & Exit " button on the utility.

Network Settings

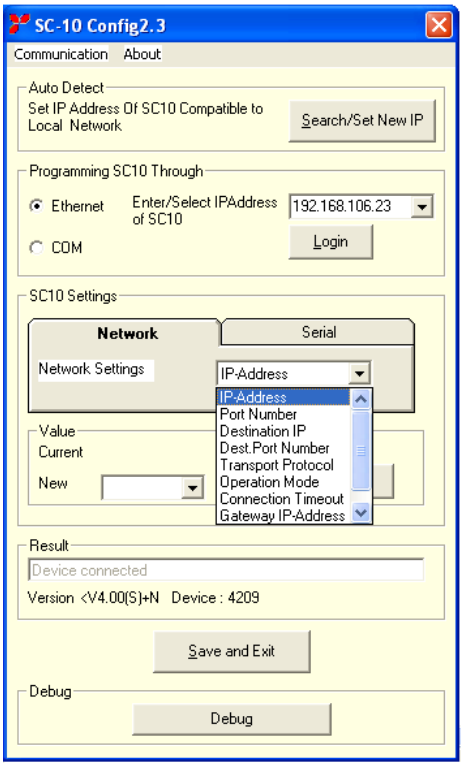


Figure 4

To set any parameter of network settings, select the parameter from the drop down list.The utility will fetch the current value from the converter and display on screen. The new value then can be entered and sent to converter by pressing "Write" Button (Figure 4).

All the network settings can be done exactly as per already specified configuration steps for a) Configuration through Serial and b) configuration through Telnet

Serial Settings

To set any parameter of serial settings, select the parameter from the Drop Down List. The utility will fetch the current value from the converter and display on screen. The new value then can be entered and send to the converter by pressing "Write" Button.(Figure 5)

All the serial settings can be done exactly as per already specified configuration steps for a) Configuration through Serial and b) configuration through Telnet

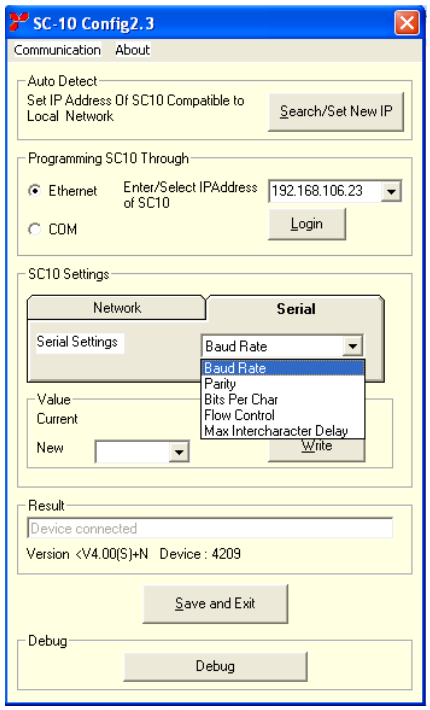


Figure - 5

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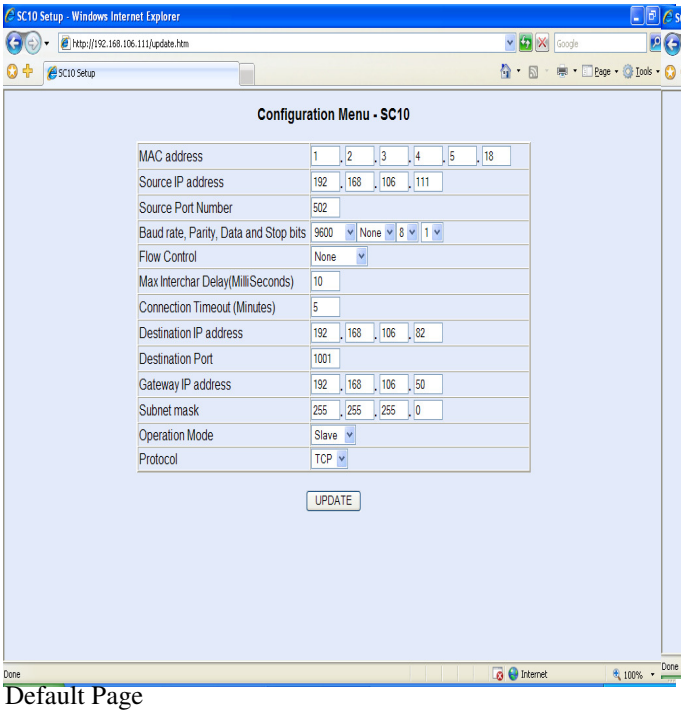
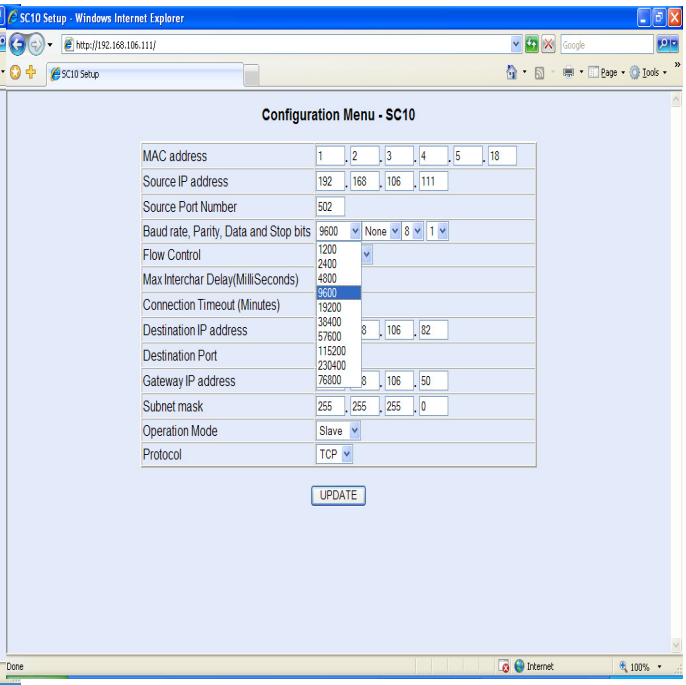
CONFIGURATION THROUGH HTTP (IE) : -

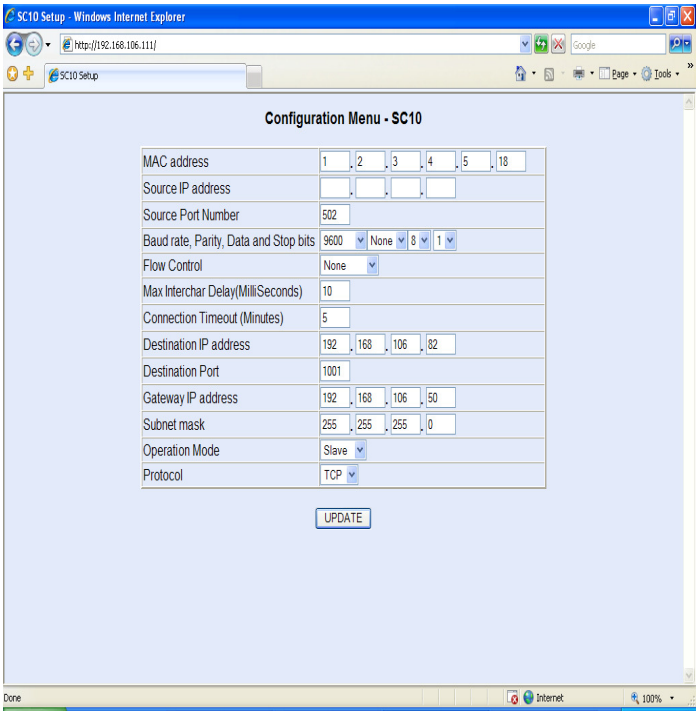
Open Internet Browser using the IP of the device.
Proceed as per the screens below.



Default Page



Serial Parameter Setting



Network Parameter Setting

4. OPERATION IN NORMAL MODE

Ensure that you have configured the SC10 EJ before entering this mode. If at Power On, DIP 1 is OFF, then SC10 EJ will go in Normal operating mode. In the **Normal Mode** there are two sub modes of operation : -

TCP Slave Mode

In **Slave Routing Mode**, SC10 EJ is always in **Listen State** (Waiting for a connection). The connection command must be from peer side. In the **Slave Mode**, SC10 EJ will work with any station on the network that contacts it, irrespective of settings of Destination IP and Destination Port number in SC10 EJ's Configuration parameters.

TCP Master Mode

In the **Master Routing Mode**, SC10 EJ always initiates a connection with remote device whose IP Address & Port no's is set as destination IP & port no's for SC10 EJ.

Serial to Ethernet Data transfer using RTS / CTS.

If Flow control is enabled, additionally RTS and CTS lines are used, apart from Tx, Rx and GND.

5. COMMUNICATION PORTS DETAILS

Serial Port Details :

Port Pin Assignments	Pin Configuration
Pin 1	TX
Pin 2	RX
Pin 3	GND
Pin 4	RTS
Pin 5	CTS
Pin 6	TX+
Pin 7	TX-
Pin 8	RX+
Pin 9	RX-

Table – 2

RS-232 / RS485-2 / 4 Wire options are available as default for Serial Communication through a 9 Pin Howder connector.
Pin Details of Serial Port is as alongside.

Ethernet Port

The SC10 EJ Converter has a RJ-45 Ethernet port. The SC10 EJ is connected using the **Straight Ethernet Cable** when connected via a Hub / Switch or a **Cross-Ethernet Cable** when connected directly to the PC.

6. DIP & LED's Status Indications

DIP Details

Set DIP Switches as given below depending upon the communication standard required by you.

	DIP 1	DIP2	DIP3	DIP4
ON	Config Mode	RS485 2 Wire	RS232	RS485 4 Wire
OFF	Normal Mode	NA	NA	NA

	DIP 5	DIP 6
Auto Negotiation	OFF	OFF
Force 100 Mbps	ON	OFF
Force 10 Mbps	ON	ON

Table – 3

NOTE : DIP1 is to be turned ON only if the configuration is being done through RS232 port.
NOTE : Turn DIP 1 OFF after configuration through Serial Port & Reset the Converter.

LED Indicators : Operation

LED No.	Indication	Status
LED 2A	Link	Active when Link is established
LED 2B	**Collision**	Active when collisions occur.
LED 4A	**Reception** on Serial side	Active when Data received.
LED 4B	**Transmission** on Serial side	Active when Data is transmitted.

Table - 4

7. Cable Details :

Cable Details : RS232 Side of SC10 EJ to any other Serial Port.

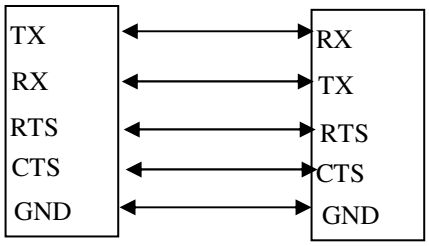


Figure - 6

Cable Details : RS485 : 4 Wire

Signal	Direction	Will Connect To
TX+	Output of SC10 EJ	RX+ of your Device
TX-	Output of SC10 EJ	RX- of your Device
RX+	Input to SC10 EJ	TX+ of your Device
RX-	Input to SC10 EJ	TX- of your Device

Table 5

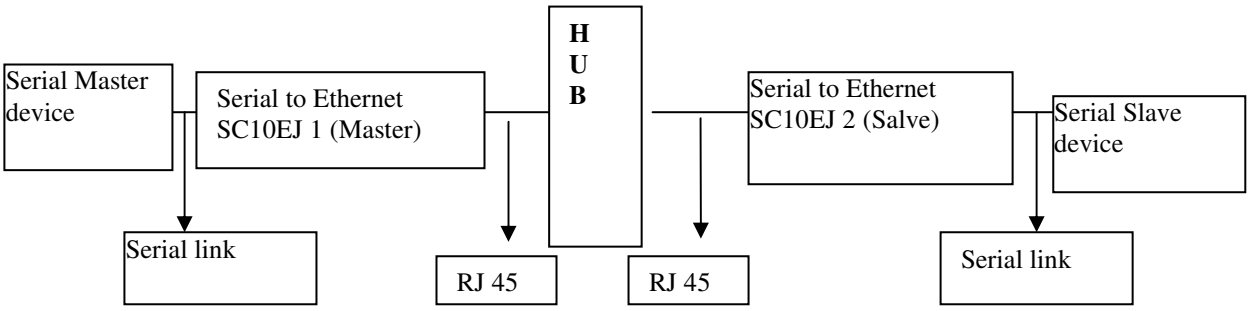
Cable Details : RS485 – 2 Wire

Signal	Direction	Will Connect To
TX+	Bi-Directional Signal	TX+ of your Device
TX-	Bi-Directional Signal	TX- of your Device

Table 6

8. Back to Back (1:1) scheme

For back to back communication between two SC10EJ make the **Connection** as follow –



Procedure

1. Configure 1 Ethernet Converter as a Master & the other Ethernet Converter as Slave.
2. Connect the Master converter to the Serial Master device (A device which is requesting for data from slave device). If application software is your Master device then the Ethernet Master converter will connect to that PC's com port.
3. Connect the Slave converter to your serial device, which is responding to requests from the Master Serial Device.

For **Configuration** of Master and Slave in SC10EJ follow step as below -

√ Set one SC10 EJ as a Master mode and another SC10EJ as a Slave mode, through option available with config utility i.e. "Operation Mode".
√ Configure the destination IP of the Master Converter as same as the source IP address of the Slave converter.
√ Configure the destination Port number of the Master Converter as same as the source Port number of the Slave converter.
√ Ensure Serial parameters of Master and Slave are identical.
√ Before going for required application setup, check basic communication test by telnet and HyperTerminal.

NOTE : Consult Us for 1 to Many Back to Back Scheme.

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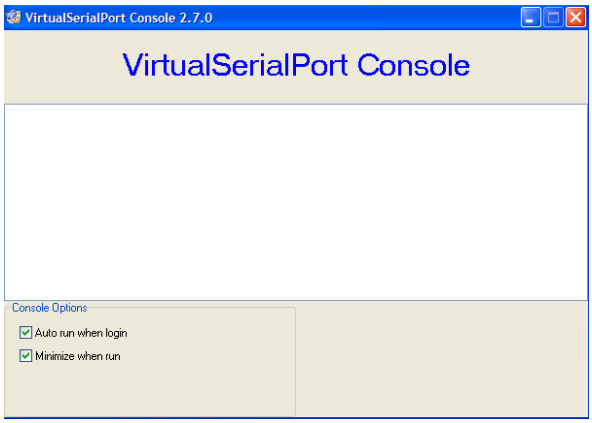
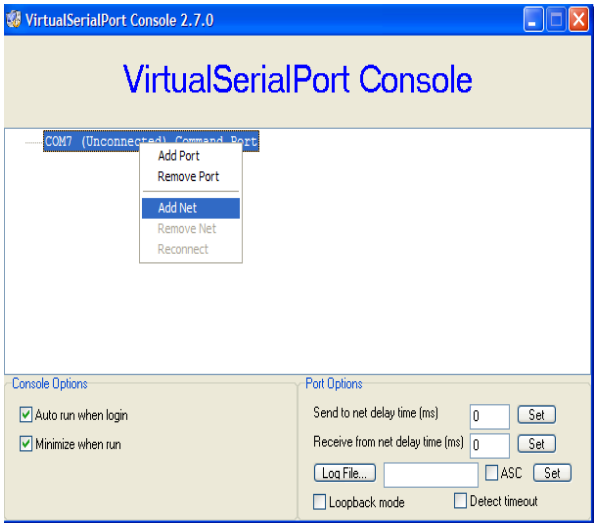
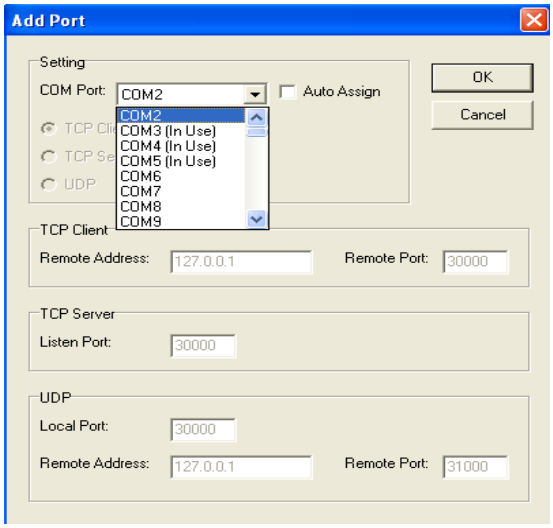
CONFIGURATION FOR VIRTUAL SERIAL PORT CONSOLE :VER 2.7.0

- Unzip from SC10EJConfig\Virtual Com\Vserport.zip in the enclosed CD.
- Double click on required exe File .



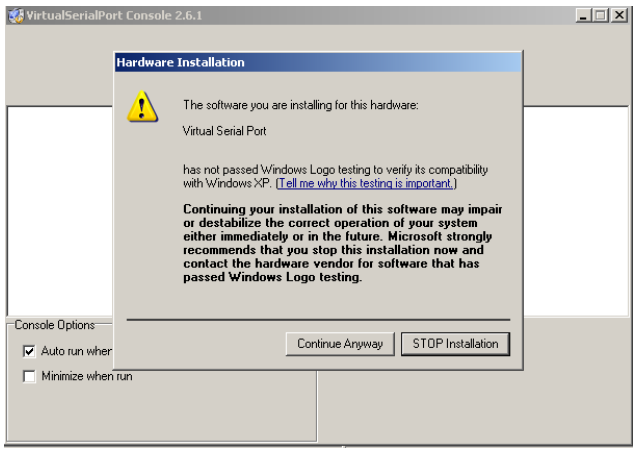
- Follow the below screens to install the Virtual Com Port.
- Right Click inside the above screen to get "Add the Port Option "

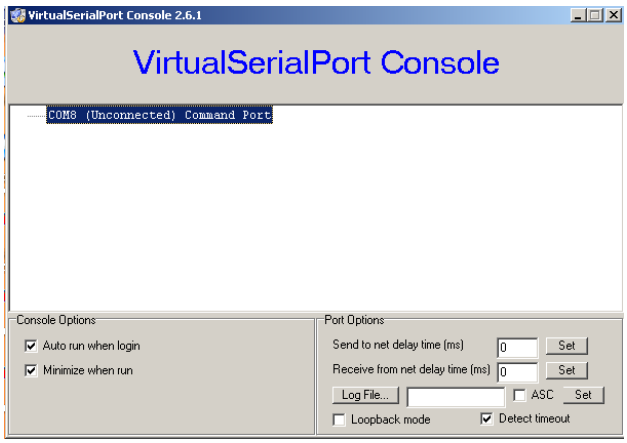




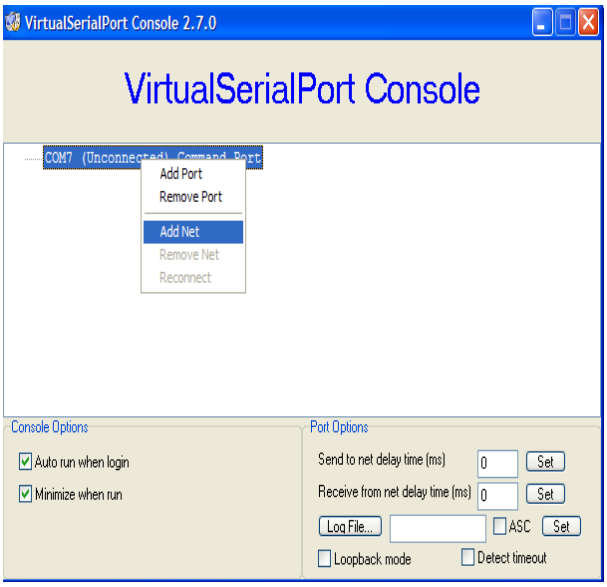
Add Port

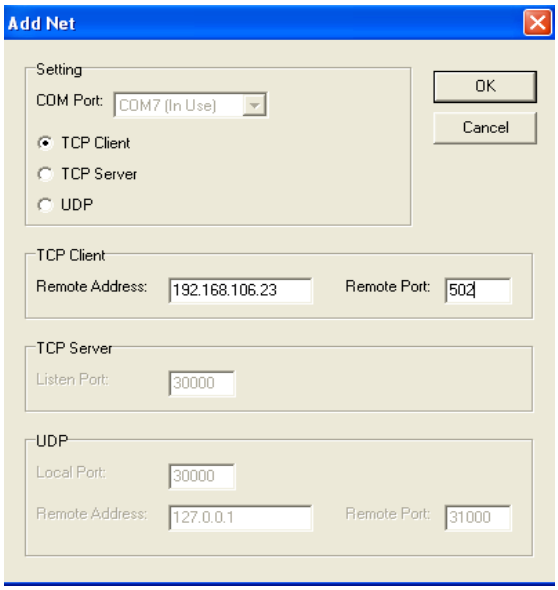
- The following screens below will appear.
- Select " Continue Anyway".
- Selected COM Port will be Added. Port no's 8 in the picture is only for reference.


VirtualSerialPort Console 2.6.1
Hardware Installation
The software you are installing for this hardware:
Virtual Serial Port
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation
Console Options
Auto run when
Minimize when run



- Right Click on the added COM port & choose Add Net option. The snap shots are below
- In the next screen you are required to insert Network details





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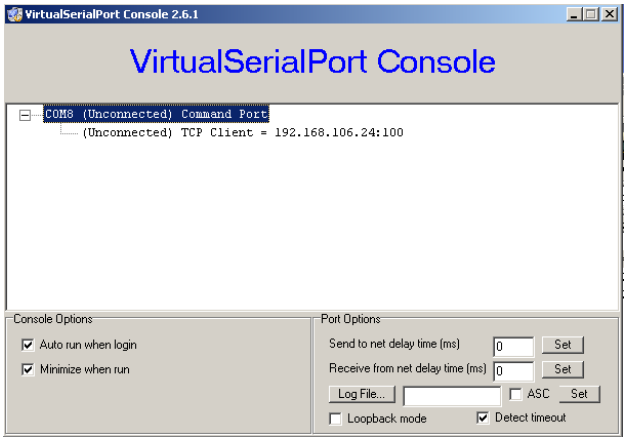
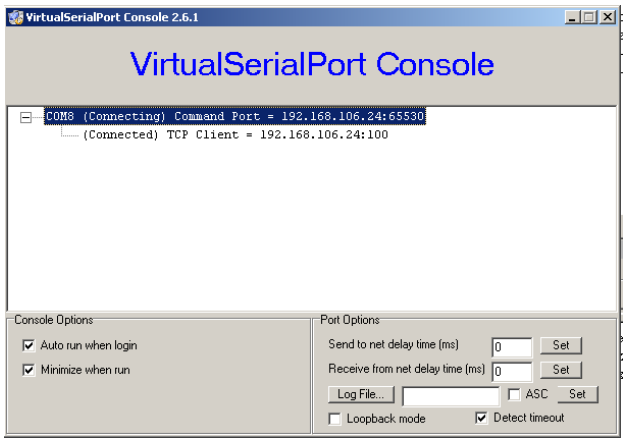
Following screens are the confirmation of the IP selected & communication established





Congratulations!!! The Virtual Com Port is installed